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(54) IMPROVEMENTS IN OR RELATING TO DEVICES FOR REMOVING, DIVING OR COAGULATING TISSUES

(71) We, RICHARD WOLF GmbH, a German Body Corporate, of 22 Pforzheimer Strasse, 7134 Knittlingen, Federal Republic of Germany, do hereby declare the invention, for which we pray that a patent may be granted to us, and the method by which it is to be performed, to be particularly described in and by the following statement:—

The invention relates to a device for removing, dividing or coagulating tissues.

To remove tissues, e.g. polyps, rugal hypertrophies or swellings from the stomach using a flexible or semi-flexible gastroscope, for dividing or coagulating tissues using suitable endoscopes, devices having electrodes in the form of loops are used which are fed with HF (high frequency) current, the loops being connected to one pole of a current source by means of a conductor which runs through a tube, while the area being operated on serves to open a path to the other pole of the current source either via the patient's body and a metal plate applied to the body, or via the barrel of the endoscope. With these known embodiments the possibility exists of uncontrollable currents passing through the patient's body and in some circumstances these may be very dangerous.

Also known are coagulating instruments which have two conductors connected to a current source, which conductors extend through a flexible barrel and terminate distally in an insulation free loop whose resistance causes it to heat up and which is used to coagulate, remove or divide tissues. Such loops only operate satisfactorily when the whole of them rests against the tissue. If an HF current source is used for this, then the HF current flows away via the body of the patient and there is therefore a possibility of uncontrollable HF currents arising. When cutting away tissues, e.g. polyps, if the polyp should touch a healthy area of tissue, burns might be caused at the point of contact.

The object of the invention is to prevent or reduce the possibility of uncontrollable currents being transmitted from a device used to remove, divide or coagulate tissues when HF current is employed.

To this end, the invention consists in a device for removing, dividing or coagulating tissues, comprising two electrical conductors which are insulated from each other and are connectible proximally to a source of HF current, said conductors extending through an insulating body and continuing distally to form electrode members having mutually spaced parts which are insulation-free, the distal end of the electrode members being held together at a distance from one another in an insulating member.

In this way, the HF current which flows through the tissue to be removed, divided or coagulated from one electrode member to the other electrode member only flows within the area bounded by the electrode members, which prevents or reduces the possibility of uncontrollable currents being transmitted to the body of the patient and also prevents burns from being caused to healthy areas of tissue.

The invention will now be further described with reference to the drawing, which shows a part-sectional side-view of one embodiment of a device according to the invention.

The embodiment shown in the drawings comprises electrode members having mutually spaced parts 8 which are used for removing, dividing or coagulating tissues in body cavities and which may for example comprise spring-steel wire. The electrode members are continuations of two electrical conductors 2 and 3 which are insulated from each other and extend through an insulating body constituted by a sheath 4 to the proximal end of the device, which sheath 4 is advantageously flexible. The conductors 2, 3 terminate proximally in plugs 5, 6 by means of which the two conductors and thus the electrode members can be connected to a source of HF current. The free (distal) ends of the two electrode members are held together at a distance from one another in an insulating member 7.

The device is brought up to the tissues, such as polyps, rugal hypertrophies or swellings, which are to be removed, divided or coagulated, by means of a flexible or semi-

flexible gastroscope or other endoscope and is then connected to the source of HF current. The removal, dividing or coagulation of the tissues then takes place solely between the insulation-free parts of the electrode members with no danger to the patient. Uncontrollable HF currents are prevented from being transmitted into the patient's body in this way and the burning of healthy areas of tissue is avoided.

WHAT WE CLAIM IS:—

1. A device for removing, dividing or coagulating tissues, comprising two electrical conductors which are insulated from each of other and are connectible proximally to a source of HF current, said conductors extending through an insulating body and continuing distally to form electrode members having mutually spaced parts which are insulation-free, the distal ends of the electrode members being held together at a distance from one another in an insulating member.

2. A device for removing, dividing or coagulating tissues, substantially as hereinbefore described with reference to the accompanying drawing.

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1 SHEET *This drawing is a reproduction of the Original on a reduced scale*